

LISTING OF THE CLAIMS

1. (Previously Presented) A redundant cooling device for an electric submarine drive motor, comprising:
a first cooling circuit and a second cooling circuit, adapted to transport thermal energy away from the electric submarine drive motor, wherein coolant of the first cooling circuit and coolant of the second cooling circuit are adapted to flow in counter-current through a stator cooling ring of the electric submarine drive motor, in a region of the electric submarine drive motor.
2. (Previously Presented) The redundant cooling device as claimed in claim 1, wherein a main pump and a minor pump, with considerably lower power in comparison with the main pump, are arranged in each cooling circuit.
3. (Previously Presented) The redundant cooling device as claimed in claim 2, wherein the main pump and the minor pump of each cooling circuit include supply voltages that are independent from each other.
4. (Previously Presented) The redundant cooling device as claimed in claim 2, wherein each cooling circuit is operatable in a low speed range of the electric submarine drive motor, exclusively by use of the minor pump assigned thereto.
5. (Previously Presented) The redundant cooling device as claimed in claim 4, wherein each cooling circuit is operatable above a low speed range of the electric submarine drive motor, by use of the main pump assigned thereto.
6. (Previously Presented) The redundant cooling device as claimed in claim 1, wherein a coupling valve is respectively arranged in transfer lines provided between the two redundant cooling circuits.

7. (Previously Presented) The redundant cooling device as claimed in claim 6, wherein the coolant circulation of the two cooling circuits connected to each other when the coupling valves are open is accomplished by use of one of the two main pumps, the output power of the electric submarine drive motor being adaptable to the amount of heat which is then removable.
8. (Previously Presented) The redundant cooling device as claimed in claim 1, wherein the redundant pump units, heat exchangers, fittings, and valves are arranged on the upper part of the electric submarine drive motor.
9. (Previously Presented) The redundant cooling device as claimed in claim 1, wherein the two cooling circuits each have a cooling branch, by which inverter modules assigned to the submarine drive motor are coolable.
10. (Previously Presented) The redundant cooling device as claimed in claim 1, wherein the coolant in the two cooling circuits is re-coolable by use of sea water in a water-water heat exchanger or water-air heat exchanger.
11. (Previously Presented) The redundant cooling device as claimed in claim 2, wherein the main pump and the minor pump of each cooling circuit is assigned a power supplying and a switching unit, the dedicated cooling plates of which are cooled by use of a further cooling branch of each cooling circuit.
12. (Previously Presented) The redundant cooling device as claimed in claim 2, wherein the motors of the two minor pumps of each cooling circuit are operated with at least one of a fixed supply voltage and supply frequency.
13. (Previously Presented) The redundant cooling device as claimed in claim 2, wherein the main pumps of each cooling circuit are supplied via inverters, in order to adapt the delivery rate of the cooling liquid, and with it the amount of heat to be removed, via the variable speed of the motors.

14. (Previously Presented) The redundant cooling device as claimed in claim 2, wherein the motors of the two main pumps are formed as squirrel-cage three-phase asynchronous motors.
15. (Previously Presented) The redundant cooling device as claimed in claim 2, wherein an independent supply voltage is provided for each main pump and minor pump.
16. (Previously Presented) The redundant cooling device as claimed in claim 1, wherein each cooling circuit includes an expansion vessel for the cooling liquid.
17. (Previously Presented) The redundant cooling device as claimed in claim 1, wherein each cooling circuit has a degassing device and a service connection for the cooling liquid.
18. (Previously Presented) The redundant cooling device as claimed in claim 1, wherein each cooling circuit has a pressure-relief valve.
19. (Previously Presented) The redundant cooling device as claimed in claim 1, wherein a temperature sensor is arranged in each of the two cooling circuits.
20. (Previously Presented) The redundant cooling device as claimed in claim 11, wherein a pressure-independent flow governor is respectively arranged in each of the two cooling circuits upstream of the stator cooling ring, upstream of the inverter modules and upstream of the power supplying and switching unit.
21. (Previously Presented) The redundant cooling device as claimed in claim 1, wherein a temperature-controlled three-way valve is present in each of the two cooling circuits.
22. (Previously Presented) The redundant cooling device as claimed in claim 2, wherein a nonreturn valve is respectively present in a pressure side of the minor pumps and the main pumps.

23. (Previously Presented) The redundant cooling device as claimed in claim 1, wherein quick-action couplings that shut off in both directions are arranged in the connecting elements between the redundant cooling device and the submarine drive motor.
24. (Previously Presented) The redundant cooling device as claimed in claim 3, wherein each cooling circuit is operatable in a low speed range of the electric submarine drive motor, exclusively by use of the minor pump assigned thereto.
25. (Previously Presented) The redundant cooling device as claimed in claim 24, wherein each cooling circuit is operatable above a low speed range of the electric submarine drive motor, by use of the main pump assigned thereto.